

Algebra 2 - Final Exam Review

Cross out problems:

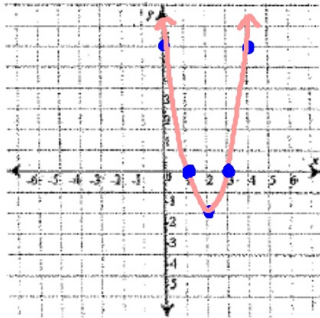
page 5 #1 and 2

page 6 #5 and 6

page 7 #9 and 10

3.) The table below represents a quadratic function. Using a graph what are the zeros of $f(x)$? xint

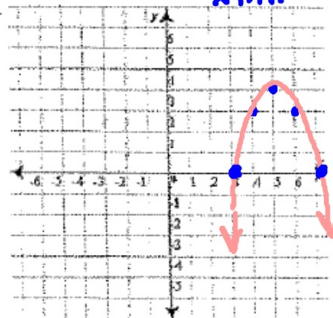
x	f(x)
0	6
2	-2
3	0
4	6



$(1, 0)$ $(3, 0)$

3.) YOU TRY: The table below represents a quadratic function. Using a graph what are the zeros of $f(x)$? xint

x	f(x)
3	0
4	3
5	4
6	3



$(3, 0)$ $(7, 0)$

4.) What is the equation of the parabola with vertex $(-1, 3)$ passes through the point $(-2, -2)$?

h, k

$$y = a(x-h)^2 + k$$

$$-2 = a(-2+1)^2 + 3$$

solve for a !

$$-2 = 1a + 3$$

$$-5 = \underline{1a} \quad a = -5$$

(A) $y = 5(x+1)^2 + 3$

(B) $y = -5(x+1)^2 + 3$

(C) $y = 5(x-1)^2 + 3$

(D) $y = -5(x-1)^2 + 3$

4.) YOU TRY: What is the equation of the parabola with vertex $(3, 2)$ passes through the point $(-2, -3)$?

h, k

$$y = a(x-h)^2 + k$$

$$-3 = a(-2-3)^2 + 2$$

$$-3 = 25a + 2$$

$$\frac{-5}{25} = \frac{25a}{25} \quad a = -\frac{1}{5}$$

(A) $y = 5(x+3)^2 + 2$

(B) $y = -5(x-3)^2 + 2$

(C) $y = \frac{1}{5}(x+3)^2 + 2$

(D) $y = -\frac{1}{5}(x-3)^2 + 2$

5.) The area of a rectangle is defined by the function $f(x) = x^2 + 3x - 10$. Determine the value(s) of x if the area is 98 ft².

$$\begin{array}{r} x^2 + 3x - 10 = 98 \\ -98 \quad -98 \\ \hline \end{array}$$

$$x^2 + 3x - 108 = 0$$

$$(x+12)(x-9) = 0$$

$$x+12=0 \quad x-9=0$$

$$x = -12 \quad x = 9$$

(A) $x = 12, -9$

(B) $x = -12, 9$

(C) $x = 12$

(D) $x = 9$

5.) YOU TRY: The area of a rectangle is defined by the function $f(x) = x^2 - 7x + 54$. Determine the value(s) of x if the area is 84 ft².

$$\begin{array}{r} x^2 - 7x + 54 = 84 \\ -84 \\ \hline \end{array}$$

$$x^2 - 7x - 30 = 0$$

$$(x-10)(x+3) = 0$$

$$x = 10, -3$$

(A) $x = -10, 3$

(B) $x = 10, -3$

(C) $x = 10$

(D) $x = 3$

6.) An object is shot into the air and is represented by the equation $f(x) = -.25x^2 + 16x$, how long will it take for the object to hit the ground? $\text{height} = 0$
 $y = 0$



$$0 = -.25x^2 + 16x$$

$$-.25(-)^2 + 16(-)$$

- (A) 4 seconds
- (B) 16 seconds
- (C) 64 seconds
- (D) 4 seconds

6.) An object is shot into the air and is represented by the equation $f(x) = -.2x^2 + x$, how long will it take for the object to hit the ground? $\text{height} = 0$
 $y = 0$

$$0 = -.2x^2 + x$$

- (A) 0 seconds
- (B) 5 seconds
- (C) 10 seconds
- (D) 15 seconds

1.) If $f(x) = \frac{1}{x^2 - 3x - 40}$, what are the domain restrictions? what can't 'x' be?

$$x^2 - 3x - 40 = 0$$

$$(x - 8)(x + 5)$$

$$x \neq 8, -5$$

- (A) $x \neq -8, 5$
- (B) $x \neq 8, 5$
- (C) $x \neq 8$
- (D) $x \neq 5$

works because just domain

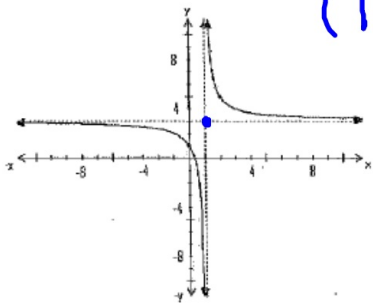
1.) YOU TRY: If $f(x) = \frac{1}{x^2 - 9x + 18}$, what are the domain restrictions? what can't 'x' be?

$$x^2 - 9x + 18 = 0$$

$$(x - 6)(x - 3)$$

$$x \neq 6, 3$$

2.) The graph below is a translation of the parent function $f(x) = \frac{1}{x}$. What is the equation of the function? HINT - $f(x) = \frac{1}{(x-h)} + k$.

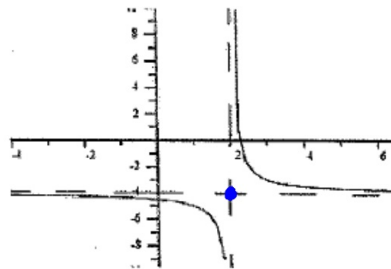


(1, 4)

$$f(x) = \frac{1}{(x-1)} + 4$$

h is always opposite, k is not!

2.) YOU TRY: The graph below is a translation of the parent function $f(x) = \frac{1}{x}$. What is the equation of the function? HINT - $f(x) = \frac{1}{(x-h)} + k$.



$$f(x) = \frac{1}{(x-2)} - 4$$

3.) Solve $x - \frac{24}{x} = 10$ LCD: _____

Ⓐ $x = \frac{10}{23}$

Ⓑ $x = -\frac{10}{23}$

Ⓒ $x = 12, -2$

Ⓓ $x = -12, 2$

3.) YOU TRY: Solve $x + \frac{6}{x} = 5$.

Ⓐ ~~$x = -1$~~

Ⓑ $x = \frac{5}{6}$

Ⓒ ~~$x = 6, -1$~~

Ⓓ $x = 3, 2$

4.) For what x values is the function $f(x) = \frac{(x+2)}{x^2+3x}$ undefined? what can't 'x' be?

$$x^2 + 3x = 0$$

$$x(x+3) = 0$$

$$x=0 \quad x+3=0$$

$$\boxed{x=0, -3}$$

4.) YOU TRY: For what x values is the function $f(x) = \frac{(x-6)}{x^2-5x}$ undefined?

$$x^2 - 5x = 0$$

$$x(x-5) = 0$$

$$x=0 \quad x-5=0$$

$$\boxed{x=0, 5}$$

5.) $\frac{x^2-9}{x^2+2x-8} \cdot \frac{x^2+9x+20}{x^2-3x} =$

$$\frac{\cancel{(x-3)}(x+3)}{\cancel{(x+4)}(x-2)} \cdot \frac{(x+5)\cancel{(x+4)}}{x\cancel{(x-3)}} =$$

$$\frac{(x+5)(x+3)}{x(x-2)}$$

or

$$\frac{x^2+8x+15}{x^2-2x}$$

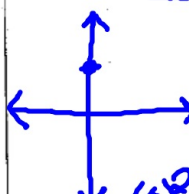
5.) YOU TRY: $\frac{x^2+6x+9}{x^2+10x+24} \cdot \frac{x^2+3x-18}{x+3} =$

$$\frac{\cancel{(x+3)}(x+3)}{\cancel{(x+6)}(x+4)} \cdot \frac{\cancel{(x+6)}(x-3)}{\cancel{(x+3)}} =$$

$$\frac{(x+3)(x-3)}{x+4} \text{ or } \frac{x^2-9}{x+4}$$

6.) Find the y-intercept of $f(x) = \frac{x^2-5x-6}{(x-1)}$.

$x=0$



$$y = \frac{(0)^2 - 5(0) - 6}{(0-1)} = \frac{-6}{-1}$$

$$(0, 6)$$

$(6, 0) \rightarrow \text{NO!!!}$

6.) YOU TRY: Find the y-intercept of

$$f(x) = \frac{x^2+6x+8}{(x-2)}$$

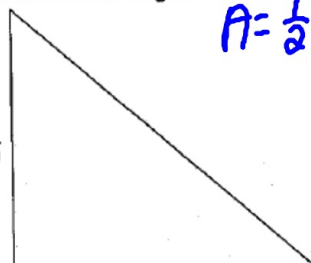
$$\frac{(0)^2 + 6(0) + 8}{(0-2)} = \frac{8}{-2}$$

$$(0, -4)$$

7.) Find the area of the triangle.

$A = \frac{1}{2} b \cdot h$

$h = \frac{20}{10x+20}$



$\frac{x^2+5x+6}{x^2+2x-3} = b$

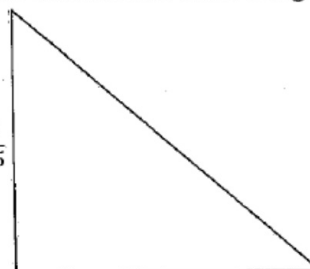
$$A = \frac{1}{2} \cdot \frac{x^2+5x+6}{x^2+2x-3} \cdot \frac{20}{10x+20}$$

$$= \frac{1}{2} \cdot \frac{(x+2)(x+3)}{(x-1)(x+3)} \cdot \frac{20}{10(x+2)}$$

$$= \frac{1}{(x-1)}$$

7.) YOU TRY: Find the area of the triangle.

$\frac{6x^2+30x}{x^2+6x+5}$



$\frac{x^2-x-6}{x^2+4x+4}$

$$A = \frac{1}{2} \cdot \frac{x^2-x-6}{x^2+4x+4} \cdot \frac{6x^2+30x}{x^2+6x+5}$$

$$= \frac{1}{2} \cdot \frac{(x-3)(x+2)}{(x+2)(x+2)} \cdot \frac{3x(x+5)}{(x+5)(x+1)}$$

$$= \frac{3x(x-3)}{(x+2)(x+1)} \text{ or } \frac{3x^2-9x}{x^2+3x+2}$$

3.) Solve $9^{3x} = 81^{x-4}$

$$9^{3x} = 9^{2(x-4)}$$

$$3x = 2x - 8$$

$$\boxed{x = -8}$$

plug
answers
in!

(A) $x = -4$

(B) $x = 8$

(C) $x = 4$

(D) $x = -8$

3.) YOU TRY: Solve $64^{2x-3} = 256^{4-x}$

$$2^{6(2x-3)} = 2^{8(4-x)}$$

$$4^{3(2x-3)} = 4^{4(4-x)}$$

$$\boxed{x = \frac{5}{2}}$$

4.) Joshua sets up a savings plan to transfer money from his checking account to his savings account. The first week \$5 is transferred, the second week \$10 is transferred, and the third week \$20 is transferred. If this pattern continues and he starts with \$150 in his checking account, how many weeks will pass before his balance is at/below zero?

(5), 10, 20, 40, 80, 160

$$\begin{array}{r} 145 \\ -10 \\ \hline 135 \end{array} \quad \begin{array}{r} 135 \\ -20 \\ \hline 115 \end{array} \quad \begin{array}{r} 115 \\ -40 \\ \hline 75 \end{array}$$

$$\begin{array}{r} 75 \\ -80 \\ \hline -5 \end{array}$$

$\boxed{5 \text{ weeks}}$

4.) YOU TRY: Brad sets up a savings plan to transfer money from his checking account to his savings account. The first week \$20 is transferred, the second week \$24 is transferred, the third week \$32 is transferred, and the fourth week \$48 is transferred. If this pattern continues and he starts with \$200 in his checking account, how many weeks will pass before his balance is at/below zero?

~~20, 24, 32, 48, 80,~~
144,

180 156 124
76
80

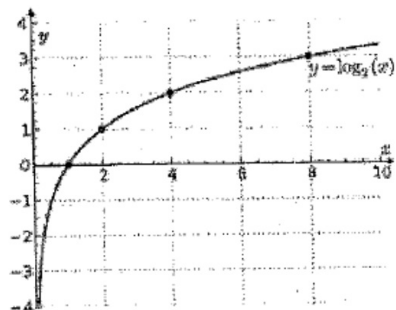
$\boxed{5 \text{ weeks}}$

7.) A logarithmic function is graphed below, find the value of the following:

$$f(2) = \underline{\hspace{2cm}}$$

$$f(4) = \underline{\hspace{2cm}}$$

$$f(8) = \underline{\hspace{2cm}}$$

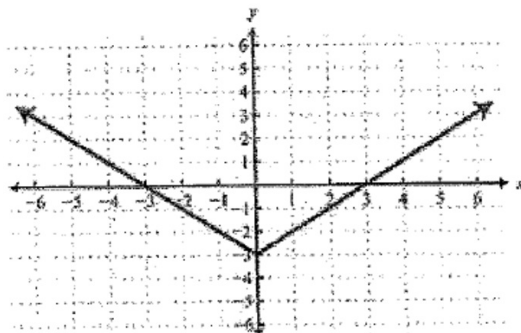


7.) An absolute value function is graphed below, find the value of the following:

$$f(-3) = \underline{\hspace{2cm}}$$

$$f(2) = \underline{\hspace{2cm}}$$

$$f(5) = \underline{\hspace{2cm}}$$



8.) If $7^x = 35$, find the value of 7^x .

8.) YOU TRY: If $25^{2x} = 125^{x-3}$, find the value of 5^x .

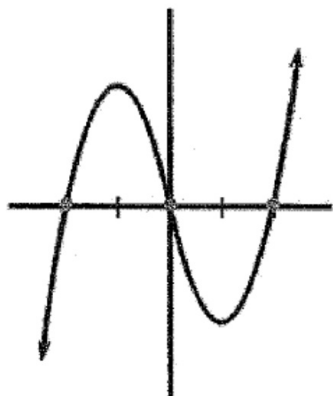
1.) What is the slope of the line $4x - 3y = 9$?

1.) YOU TRY: What is the slope of the line $3x + 2y = 6$?

2.) Given that one zero of $f(x) = x^3 + 9x^2 + 23x + 15$ is -5, what are the other two zeros?

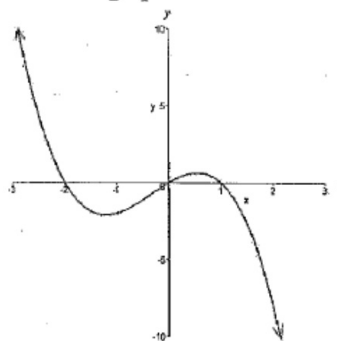
2.) YOU TRY: Given that one zero of $f(x) = x^3 - x^2 - 14x + 24$ is 3, what are the other two zeros?

3.) Which of the following equations could represent the graph below:



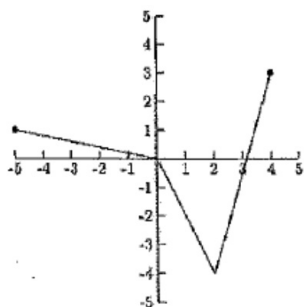
- a.) $-x^3 + 4x$
- b.) $x^3 - 4x$
- c.) $x^3 - 2x + 2$
- d.) $-x^3 + 2x - 2$

3.) YOU TRY: Which of the following equations could represent the graph below:

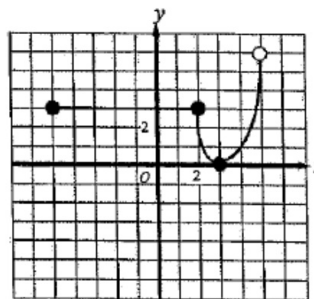


- a.) $x^3 - 2x^2 + 1$
- b.) $-x^3 + 2x^2 - 1$
- c.) $x^3 - x^2 - 2x$
- d.) $-x^3 + x^2 + 2x$

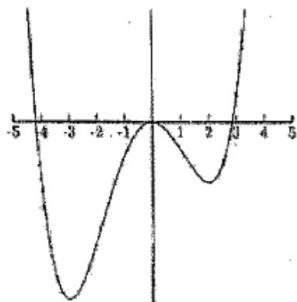
4.) State the domain and range.



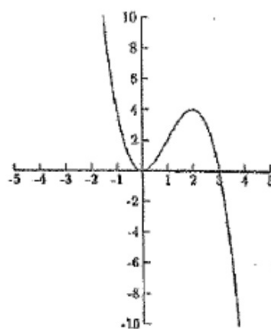
4.) YOU TRY: State the domain and range.



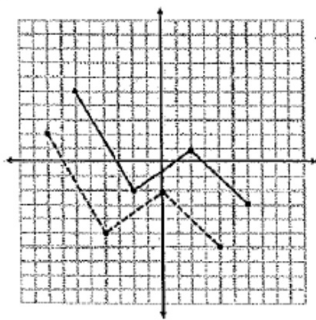
5.) Identify the intervals of increase and decrease.



5.) YOU TRY: Identify the intervals of increase and decrease.

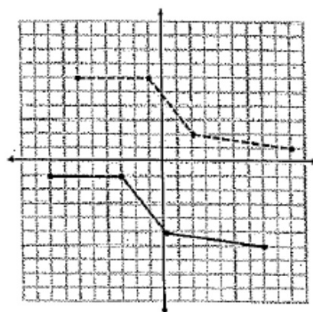


6.) The solid graph represents the graph of $f(x)$. The dotted graph represents which transformation of the solid graph?



- a.) $f(x - 2) + 3$
- b.) $f(x + 2) - 3$
- c.) $f(x + 3) - 2$
- d.) $f(x - 3) + 2$

6.) YOU TRY: The solid graph represents the graph of $f(x)$. The dotted graph represents which transformation of the solid graph?



- a.) $f(x + 2) - 7$
- b.) $f(x - 2) + 7$
- c.) $f(x + 7) - 2$
- d.) $f(x - 7) + 2$

